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New species of *Graphium* and *Periconia* from China

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Abstract—Three new species from soil in China, *Graphium variabile, G. wuweiense,* and *Periconia guangdongensis,* are described and illustrated. Specimens (dried cultures) and living cultures are deposited in the Herbarium of Shandong Agricultural University, Plant Pathology (HSAUP), and the Herbarium of Institute of Microbiology, Academia Sinica (HMAS).

Key words — dematiaceous hyphomycetes, anamorphic fungi, taxonomy

Introduction

Graphium was established by Corda (1837) and is characterized by possession of synnematous conidiophores with each synnema capped by a slimy conidial head. The conidiogenous cells are monoblastic, percurrent, subulate or cylindrical. Conidia are produced from annellides, often aggregated in slimy heads, cylindrical rounded at the apex, cuneiform or ellipsoidal, usually with a flat base, and 0-septate. Although Index Fungorum (2014) lists 173 taxa (many infraspecific), Seifert et al. (2011) estimates that the genus may contain only 19 authentic species.

Periconia was established by Tode (1791) and is characterized by macronematous, mononematous conidiophores. The conidiogenous cells are monoblastic, polyblastic, branched, and ellipsoidal. Conidia are catenate, spherical or subspherical, verruculose or echinulate, 0-septate and aggregated in heads. Seifert et al. (2011) estimates that the genus may contain 40 authentic species.

During a survey of soil dematiaceous hyphomycetes in China, several unusual species of *Graphium* and *Periconia* were collected. Two *Graphium* and one *Periconia* species are described and illustrated as new.

^Y.M. Wu and J.J. Xu contributed equally to this work.

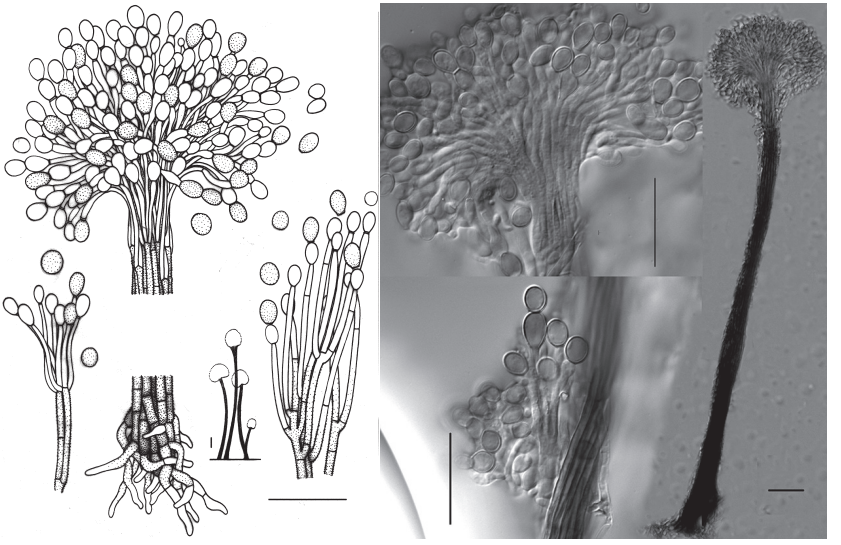

Fig. 1. *Graphium variabile* (ex holotype HSAUP II $_{04}$2789).
Conidia, conidiophores, conidiogenous cells, and synnemata. Scale bars = 25 μm.

Graphium variabile J.J. Xu & T.Y. Zhang, **sp. nov.** Fig. 1

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Differs from *Graphium eumorphum* by its conidia that are smaller and contain no oil droplets and from *G. terricola* by its larger conidia.

Type: China, Fujian Province, Xiamen National Forest Park, from a forest soil, 6 Oct. 2004, J.J. Xu (**Holotype** HSAUP II $_{04}$2789; **isotype** HMAS 196278).

Etymology: The epithet refers to the variably shaped conidia.

Colonies on CMA (Matsushima 1995) slow growing, effuse, felted, white at initial stage, then darkish brown to black. Mycelium partly superficial, partly immersed in the substratum, hyphae branched, septate, smooth, subhyaline, 2–4 μm wide. Synnemata erect, scattered, rough, brown at base paler towards the apex, 150–320 μm long, 15–30 μm wide at base, slightly splayed out at the apex. Conidiogenous cells annellides, subhyaline, subulate or cylindrical, integrated, terminal, smooth, 15–25 × 1.5–2.5 μm. Conidia acrogenous, subhyaline to hyaline, forming conidial chains and enveloped in mucilaginous secretion, ellipsoidal, pyriform, obovoid to globose, smooth, 0-septate, globose conidia 3–6.5 μm in diameter, others 5.5–7 × 3.75–5 μm, wide in the broadest part, slightly truncate at the ends.

Comments: Morphologically, *G. variabile* resembles *G. eumorphum* (Sacc.) Sacc. (Saccardo 1886) and *G. terricola* Manohar. et al. (Manoharachary et al. 1975). *Graphium eumorphum* is distinguished by longer conidia (6–8 × 3.5–4.5

μm, 2-guttulate) that contain oil droplets, while *G. terricola* produces smaller conidia (4–6.5 × 2–3.2 μm).

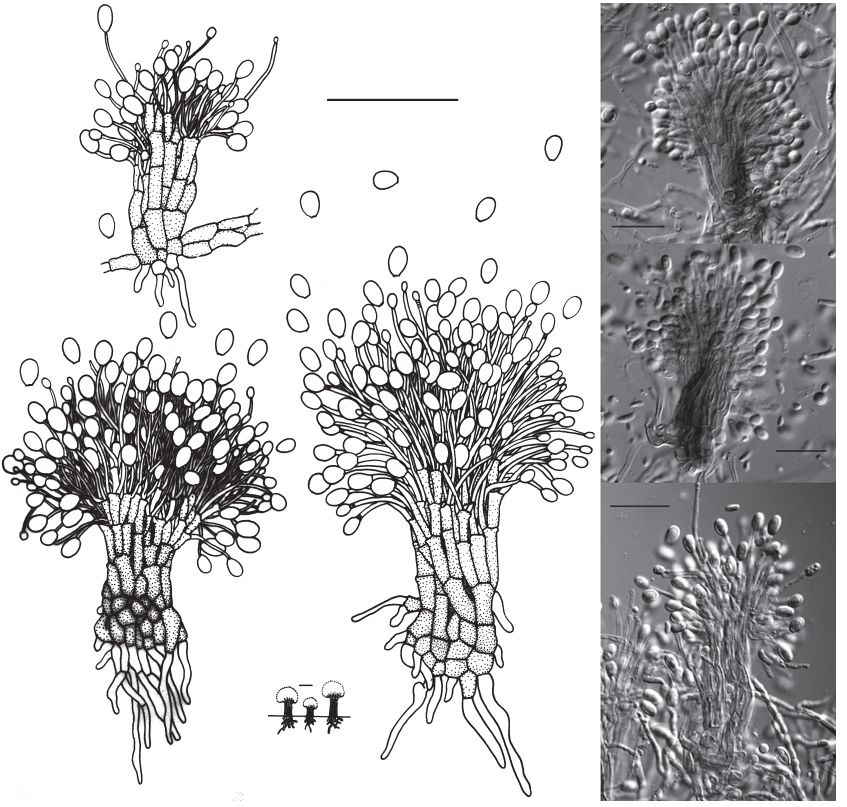

Fig. 2. *Graphium wuweiense* (ex holotype HSAUP II $_{05}$2647).
Conidia, conidiophores, conidiogenous cells, and synnemata. Scale bars = 25 μm.

Graphium wuweiense J.H. Kong & T.Y. Zhang, **sp. nov.** Fig. 2

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Differs from *Graphium adansoniae* and *G. penicillioides* by its shorter conidiophores.

Type: China, Gansu Province, Wuwei, from a desert oasis soil, 18 Apr. 2005, J.H. Kong (**Holotype** HSAUP II $_{05}$2647; **isotype** HMAS 196279).

Etymology: in reference to the type locality.

Colonies on CMA (Matsushima 1995) slow growing, effuse, white at initial stage, then darkish brown, felted. Mycelium mostly immersed in the substratum, hyphae branched, septate, smooth, subhyaline, 1.5–3 μm wide. Synnemata erect, scattered, smooth, brown at base, paler towards the apex,

20–40 μm long, 10–20 μm wide at base, slightly splayed out at the apex. Conidiogenous cells annellides, hyaline, subulate or cylindrical, integrated, terminal, smooth, 7–18 × 1.5–2.5 μm. Conidia acrogenous, hyaline, forming conidial chains enveloped in mucilaginous secretion, ellipsoidal, pyriform to obovoid, smooth, 0-septate, truncate at the base, 4–6 μm long, 3–5 μm wide.

Comments: Morphologically, *Graphium wuweiense* is most similar to *G. adansoniae* Cruywagen et al. (Cruywagen et al. 2010) and *G. penicillioides* Corda (Corda 1837). However, both of these species have much longer conidiophores (*G. adansoniae*, 88–150 μm; *G. penicillioides*, up to 200 μm).

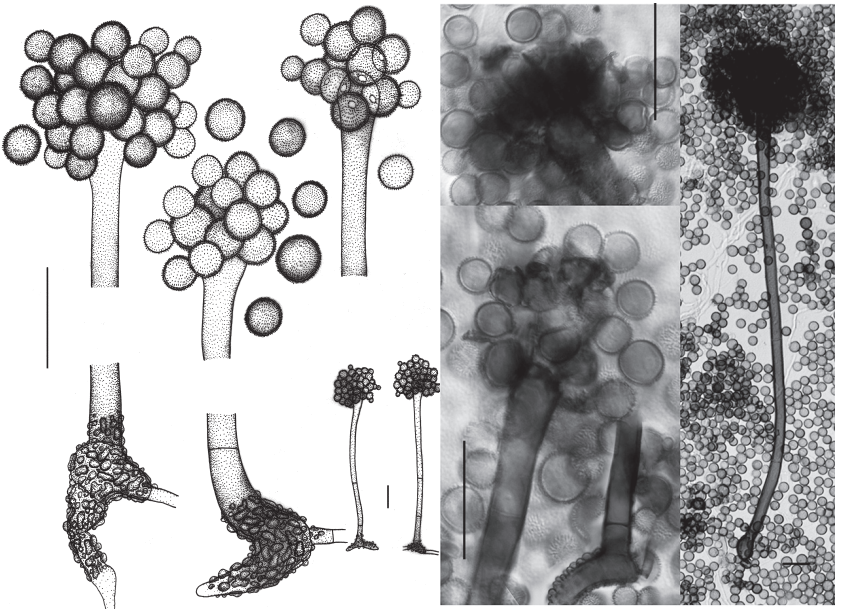

Fig. 3. *Periconia guangdongensis* (ex holotype HSAUP II$_{04}$3133). Conidia, conidiophores, and conidiogenous cells. Scale bars = 25 μm.

Periconia guangdongensis J.J. Xu & T.Y. Zhang, **sp. nov.** Fig. 3

MycoBank MB 807386

Differs from *Periconia cookei* and *P. pseudobyssoides* by its shorter globose conidiophores and smaller conidia.

Type: China, Guangdong Province, Meizhou, from a grassland soil, 10 Aug. 2004, J.J. Xu (**Holotype** HSAUP II$_{04}$3133; **isotype** HMAS 196280).

Etymology: in reference to the type locality.

Colonies on MEA (Lefebvre et al. 1949) effuse, initially white, then grey to greyish brown, cottony or fine hairy. Mycelium superficial or immersed,

hyphae branched, septate, sometimes rough, subhyaline, 1.5–4 µm wide. Conidiophores macronematous, mononematous, straight or slightly flexuous, smooth although often verrucose at base, pale brown to mid-brown, unbranched, 3–4-septate, 230–480 µm long, 7–9 µm wide at base, often swollen at apex. Conidiogenous cells globose, directly arising from the swollen apex, pale brown to dark brown, 5–9 µm diam. Conidia globose to subglobose, 0-septate, smooth initially but echinulate at maturity, brown to dark brown, 7–11 µm diam.

Comments: Morphologically, *Periconia guangdongensis* slightly resembles *P. cookei* E.W. Mason & M.B. Ellis (Mason & Ellis 1953) and *P. pseudobyssoides* Markovsk. & Kačergius (Markovskaja & Kačergius 2014). However, *P. cookei* has larger non-globose conidia (13 × 16 µm) and shorter conidiophores (88–150 µm), and *P. pseudobyssoides* has larger non-globose conidia (15 × 17 µm) with conidiophores up to 600 µm.

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